Measuring the Systemic Impact of the Kentucky Department of Education's Cardiovascular Health Project: A Final Report

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I. Introduction

Murray State University's Bureau of Business and Economic Research has served for three and a half years as the evaluator of the Kentucky Department of Education's Cardiovascular Health Project. One of the most important goals of the evaluation was to measure if the project has caused systemic changes in the schools across the Commonwealth. The assessment of systemic change is the basis of the final report. In order to evaluate the amount of systemic change, the research strategy focuses on changes over time in the schools' consolidated plans (presently called Comprehensive Improvement Plans). Bureau staff collected a stratified random sample of 1998 consolidated plans from schools across the Commonwealth and tabulated the number of items in each of the plans related to cardiovascular health. These plans were written before the KDE Cardiovascular Project was initiated and therefore they serve as a pre-project benchmark. Bureau staff also collected 2002 consolidated plans from the same sample of schools. The increase in the percentage of schools including items related to cardiovascular health is the measure of systemic change. This report describes the procedures and results from the analysis of the consolidated plans.

II. Consolidated Planning

The Kentucky Department of Education (KDE) introduced the consolidated planning process in 1997. The consolidated plans are the schools and districts major planning document and they are supposed to outline in detail how the schools and districts "plan to

insure how students reach proficiency and beyond by 2014."[1] The consolidated planning process is a joint effort between KDE and the local school and district stakeholders to plan for improvement by focusing in on priority needs. Therefore by examining the consolidated plans to determine if there is any mention of activities, curriculum, or programs related to cardiovascular health, one can determine if cardiovascular health is identified by the stakeholders as a "priority need". It is important to note that schools do not list every single initiative in their consolidated plans, so the consolidated plans do not illustrate the full scope of the activities that a school engages in. However, the consolidated planning process does a good job of identifying the priorities of the schools and districts.

III. Data Description

KDE divides the Commonwealth into eight service regions. In order to assure that the sample included schools from all the service regions, the service regions were used as the strata. From each service region six high schools were randomly selected. Then one of the middle schools feeding into each high school was randomly selected and one elementary school feeding into each middle school was also randomly selected. One would assume then that the stratified random sample contained 144 schools. However, some of the high schools do not have a middle school because the high school serves grades 7-12 or the elementary school serves grades K-8. These situations reduce the sample to 130 schools.

In order to collect the consolidated plans, a letter was sent to each of the schools in the sample requesting that the school send a copy of their consolidated plan to the Bureau

[1] http://www.kentuckyschools.net/KDE/Administrative+Resources/School+Improvement/

of Business and Economic Research at Murray State University. The letter also explained that the plans would be used to evaluate the Cardiovascular Health Project and that the schools themselves were not being evaluated. If a consolidated plan was not received from the district after three weeks, bureau staff then telephoned the school to request a copy of their consolidated plan. In addition some of the coordinators of the Cardiovascular Health Project helped to contact the schools and helped gather copies of consolidated plans. All of these efforts resulted in the Bureau acquiring 88 of the 130 1998 consolidated plans (67.69%). A similar procedure was used to acquire the 2002 consolidated plans. However, some of the 2002 consolidated plans were available on the KDE website which allowed the Bureau to acquire 117 of the 130 2002 consolidated plans (90%). For 80 of the schools in the sample the bureau has both the 1998 and the 2002 consolidated plans.

IV. Tabulation Results

Each of the consolidated plans was reviewed to see if there was any mention of activities, curriculum, or programs related to cardiovascular health. A review of the 1998 plans indicated that 14 of the 88 plans (15.91%) contained at least one mention of an activity, curriculum or program related to cardiovascular health. The review of the 2002 consolidated plans indicated that 50 of the 117 plans (42.74%) contained at least one mention of an activity, curriculum or program related to cardiovascular health. The results are summarized in Table 1. These percentage differences are statistically significant and clearly indicate the effectiveness of the Cardiovascular Health Project.

However it might be more useful to examine the changes in the percentages of schools mentioning cardiovascular health components in their consolidated plans for the

Table 1. Total Number of Consolidated Plans Collected and Reviewed

	1998	2002
Plans Collected	88	117
Plans Containing CVH Component(s)	14	50
Percentage of Plans Containing CVH Component(s)	15.91%	42.74%

set of schools in the sample where we have reviewed both the1998 and 2002 consolidated plans (a pure matched sample). For this sample of 80 schools the percentage increases from 12.5% to 48.75%. Once again these differences, which are reported in Table Two, are statistically significant.

Table 2. Number of Consolidated Plans Collected in Paired Sample

	1998	2002
Plans Collected	80	80
Plans Containing CVH Component(s)	10	34
Percentage of Plans Containing CVH Component(s)	12.50%	42.50%

As previously mentioned, the Commonwealth of Kentucky is divided into eight service regions. Some of these regions are quite different from each other in terms of population density, ethnic backgrounds, and social attitudes. Therefore it might be useful to examine separate tabulation results for each of the eight service regions. As illustrated in Table 3, in seven of the eight regions the percentage of consolidated plans that included at least one cardiovascular health component increased from 1998 to 2002. However, only the changes in percentages in Region 3 and Region 6 are statistically significant. As expected there is considerable variation across the service regions in the percentages of consolidated plans containing at least one cardiovascular health component. In 1998 the range was from 0.00% to 27.27%, while for the 2002 plans the range was from 9.09% to 77.78%.

Table 3. Total Number of Consolidated Plans from Each Region

	1998	2002
Region 1		
Plans Collected	13	16
Plans Containing CVH Component(s)	2	3
Percentage of Plans Containing CVH Component(s)	15.38%	18.75%
Region 2		
Plans Collected	13	16
Plans Containing CVH Component(s)	3	3
Percentage of Plans Containing CVH Component(s)	23.08%	18.75%
Region 3		
Plans Collected	18	18
Plans Containing CVH Component(s)	1	14
Percentage of Plans Containing CVH Component(s)	5.56%	77.78%
Region 4		
Plans Collected	7	11
Plans Containing CVH Component(s)	0	1
Percentage of Plans Containing CVH Component(s)	0.00%	9.09%
Region 5		
Plans Collected	10	15
Plans Containing CVH Component(s)	2	6
Percentage of Plans Containing CVH Component(s)	20.00%	40.00%
Region 6		
Plans Collected	8	16
Plans Containing CVH Component(s)	1	12
Percentage of Plans Containing CVH Component(s)	12.50%	75.00%
Region 7		
Plans Collected	11	14
Plans Containing CVH Component(s)	3	5
Percentage of Plans Containing CVH Component(s)	27.27%	35.71%
Region 8		
Plans Collected	8	11
Plans Containing CVH Component(s)	2	6
Percentage of Plans Containing CVH Component(s)	25.00%	54.55%

The results for the perfectly paired sample are displayed in Table 4. The results are very similar to the results in Table 3. For the perfectly paired sample five of the eight districts had an increase in the percentage of consolidated plans that included at least one cardiovascular health component. Once again the only statistically significant changes occurred in Region 3 and Region 6.

V. Effectiveness of KDE Cardiovascular Health Project Activities

A major aspect of the KDE Cardiovascular Health Project was the development of activities that educators and other community members could participate in. With assistance from KDE's Cardiovascular Health Project staff, the Bureau of Business and Economic Research put together a matrix that listed all of the activities that every school in our sample was involved in related to the Cardiovascular Heath Project.[2] This matrix was then used along with the data from the consolidated plans to construct Table 5. Table 5 indicates that the 50 schools which included a least one cardiovascular health component in their 2002 consolidated plans were slightly more likely to participate in the KDE Cardiovascular Health Project activities than the 67 schools that did not have any cardiovascular health components in their 2002 consolidated plans. The schools with at least one cardiovascular health component in their consolidated plans also had a higher average number of activities that they participated in. This data indicates that school participation in KDE Cardiovascular Health Project activities is positively correlated with the inclusion of at least one cardiovascular health component in the 2002 consolidated plans. However this correlation could have existed because schools more interested in cardiovascular health might be more likely to participate in the KDE Cardiovascular

[2] These activities are listed in the appendix to this report.

Table 4. Number of Consolidated Plans from Each Region Collected in Paired Sample

	1998	2002
Region 1		
Plans Collected	12	12
Plans Containing CVH Component(s)	2	3
Percentage of Plans Containing CVH Component(s)	16.67%	25.00%
Region 2		
Plans Collected	12	12
Plans Containing CVH Component(s)	2	2
Percentage of Plans Containing CVH Component(s)	16.67%	16.67%
Region 3		
Plans Collected	18	18
Plans Containing CVH Component(s)	1	14
Percentage of Plans Containing CVH Component(s)	5.56%	77.78%
Region 4		
Plans Collected	5	5
Plans Containing CVH Component(s)	0	0
Percentage of Plans Containing CVH Component(s)	0.00%	0.00%
Region 5		
Plans Collected	9	9
Plans Containing CVH Component(s)	1	3
Percentage of Plans Containing CVH Component(s)	11.11%	33.33%
Region 6		
Plans Collected	8	8
Plans Containing CVH Component(s)	1	6
Percentage of Plans Containing CVH Component(s)	12.50%	75.00%
Region 7		
Plans Collected	8	8
Plans Containing CVH Component(s)	1	1
Percentage of Plans Containing CVH Component(s)	12.50%	12.50%
Region 8		
Plans Collected	8	8
Plans Containing CVH Component(s)	2	5
Percentage of Plans Containing CVH Component(s)	25.00%	62.50%

Table 5. The Relationship between School Participation in KDE Cardiovascular Health Project Activities and 2002 Consolidated Plans

	Schools with CVH plan(s)	**Schools with no CVH plan(s)**
Schools	50	67
Schools that Participated in KDE CVH Activities	43	55
Percentage of schools that participated in KDE CVH activities	86.0%	82.1%
Average number of KDE CVH Activities per School	1.98	1.67

Health Project activities. If this were true one would expect the same relationship to exist with data from the 1998 plans. However as illustrated in Table 6 the relationship for 1998 is reversed. A higher percentage of schools with no mention of cardiovascular health components in their 1998 plans participated in the project activities. The average number of activities that a school participated in for schools with no mention of cardiovascular health components in their 1998 plans is also higher than the average number of activities that a school participated in for schools which have at least one cardiovascular health component in their consolidated plans.

Table 6. The Relationship between School Participation in KDE Cardiovascular Health Project Activities and 1998 Consolidated Plans

	Schools with CVH plan(s)	**Schools with no CVH plan(s)**
Schools	14	74
Schools that Participated in KDE CVH Activities	11	65
Percentage of schools that Participated in KDE CVH activities	78.6%	87.8%
Average number of KDE CVH Activities per School	1.57	1.96

Given the data from Table 6, it is safe to assume that the positive correlation in Table 5 between school participation in KDE Cardiovascular Health Project activities and inclusion of at least one cardiovascular health component in the 2002 consolidated plans is due to the effectiveness of the KDE Cardiovascular Health Project activities.

Another way to measure the effectiveness of the KDE Cardiovascular Health Project activities is to examine changes in the schools' consolidated plans based on their participation in the KDE Cardiovascular Health Project activities. To examine the effectiveness of the KDE Cardiovascular Health Project activities using this methodology one must use the perfectly paired sample of 80 schools. In this case each of the 80 schools are assigned a value for two variables CVH98 and CVH02. Each of these variables can take on a value of 0 or 1. The value of CVH98 equals 0 if the 1998 consolidated plan does not contain any mention of cardiovascular health; otherwise the value of CVH98 equals 1. This same method is used to assign values to the variable CVH02. The sample is then split into two groups: the 69 schools that participated in KDE Cardiovascular Health Project activities and the 11 schools that did not participate in any KDE Cardiovascular Health Project activities. Each of these sub samples is then divided into four categories. The results are illustrated in Table 7. Table 7 illustrates that

Table 7. The Relationship between School Participation in KDE CVH Activities and Consolidated Plans Paired Sample

		Number	**Percentage**
School Participated in KDE CVH Activities		**69**	
CVH98	**CVH02**		
0	0	33	47.8%
1	0	6	8.7%
0	1	28	40.6%
1	1	2	2.9%
School Did Not Participated		**11**	
CVH98	**CVH02**		
0	0	5	45.5%
1	0	1	9.1%
0	1	4	36.4%
1	1	1	9.1%

the percentage of schools that did not have any mention of cardiovascular health in their 1998 consolidated plans but did mention cardiovascular health in their 2002 consolidated plan is higher for the group of schools that participated in KDE Cardiovascular Health Project activities. These results are consistent with the earlier conclusion that school participation in the activities increases the likelihood of a school including cardiovascular health in their 2002 consolidated plans.

VI. Conclusions and Other Thoughts

This analysis has presented empirical evidence that clearly indicates that the Kentucky Department of Education's Cardiovascular Health Project has had a systemic impact on the Commonwealth's schools. It has also presented empirical evidence of the effectiveness of the activities associated with the KDE Cardiovascular Health Project.[3]

An important question that the analysis does not address is what impact KDE Cardiovascular Health Project staff had on the schools besides the impact of their work on the KDE Cardiovascular Health Project activities. Time sheets which were filled out by the project staff indicated that staff used some of their time assisting individual schools and school districts through school visits and phone consultations. However the time sheets were not completed over the life the program and the format of the time sheets changed several times; therefore it is not possible to separate out the effectiveness of this type of assistance.

[3] Note: The analysis presented in this document is technically only an analysis of program activities through the time period when the 2002 consolidated plans were written. This is why only the schools' participation in activities through the 2001 year are included in the data analysis. However, Murray State University's Bureau of Business and Economic Research has evaluated the KDE Cardiovascular Health Project activities completed by Fall 2002. These individual program activity evaluations have already been forwarded to KDE and illustrate that these activities also had positive impacts.

There are two other issues that should be addressed in the future. If involvement in KDE Cardiovascular Health Project activities brings about systemic change in schools then more attention needs to be focused on increasing the percentage of schools involved in these activities. It is also important for KDE to develop a strategy that will both sustain and enhance the progress that has been made through the Cardiovascular Heath Project. This will be especially important if the KDE's recent proposal to the Centers for Disease Control is not funded.

Appendix

KDE Cardiovascular Health Project Activities

1. 2001 Practical Living Summer Teacher Academy
2. ASPIRE Participant
3. Associates Training
4. CVH Community Forum Meeting -- Filming
5. CVH Community Forum Meeting -- Host
6. CVH Community Forum Meeting -- Participant
7. CVH Primary Physical Activity Unit Developer
8. CVH Units of Study Training
9. Developed CVH Activity Resource List after Scholastic Review
10. District Health Policy Development Training
11. Heart Healthy School Applicant
12. Heart Healthy Schools Participant
13. Individual School Visit by Judy Payne
14. Participated in Physical Activity Summit T-Shirt Contest
15. PD Partners
16. Piloted CVH Units of study
17. Piloted High School Physical Activity Unit of Study
18. Piloted Middle School Interdisciplinary Unit of Study
19. Piloted Middle School Physical Activity Unit of Study
20. Piloted Middle School Tobacco Unit of Study
21. Piloted Primary Interdisciplinary Unit of Study
22. Piloting Class
23. Provide Technical Assistance with Kentucky Coordinated School Health Institute Mini-Grant
24. Public Health training on Consolidated planning and Units of Study
25. Staff Wellness Grant Applicant
26. Staff Wellness Grant Participant
27. Training on Student Work and Performance Standards
28. Unit Training
29. Units of Study

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